

**FIVE-YEAR REVIEW
NORTHERN ENGRAVING CORPORATION
SPARTA, WISCONSIN**

I. Introduction

A. Authority and Purpose

The U.S. EPA has conducted a Five-Year Review of the Remedial Action (RA) which was implemented at the Northern Engraving Corporation (NEC) Superfund Site located in Sparta, Wisconsin. This is a statutory review. The purpose of a statutory five-year review is to evaluate whether the remedial action remains protective of human health and the environment. This review focuses on the protectiveness of the Northern Engraving Corporation. This review will be placed in the Site files and local repository for the Northern Engraving Corporation Site located at 77 W. Jackson, Chicago, IL 60604.

Section 121(c) of the Comprehensive Environmental Response, Compensation and liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and Section 300.430 (f) (4) (ii) of the National Oil and Hazardous Substance Contingency Plan (NCP), require the periodic (no less often than five years) reviews are to be conducted for sites where hazardous substances, pollutants, of contaminants remain at the site above levels that will not allow for unlimited used of unrestricted exposure following the completion of all remedial actions for the site.

U.S. EPA has established a three-tier approach to conducting five-year reviews, the most basic of which provides a minimum protectiveness evaluation (Level I Review). U.S. EPA determines the level of the review based on site-specific considerations, including nature of the response action, the status of on-site response activities, and the proximity to populated areas and sensitive environmental areas. A Level I review was conducted at the NEC Site and consisted of a review of all documents and data associated with the RA.

II. SITE HISTORY

The NEC site is located in Sparta, Wisconsin, Wisconsin at 803 South Black River Street (Figure 1). Sparta is a rural community with a population of 6,800 approximately 25 miles east of LaCrosse. The NEC facility is adjacent to residential and business areas and abuts the LaCrosse River which forms the southern boundary of the site. Domestic water is supplied to most residences in the city through a public distribution system. Production wells for this system are about 3/4 mile from the site and draw water from a bedrock aquifer at depths from 105 to 260 feet. The closest private well is located approximately 1/4 mile from the NEC facility. Private wells are completed in the bedrock aquifer.

The site is presently the location of NEC manufacturing activities. NEC produces metal name

plates, dials, and decorative trim for the automotive industry utilizing anodizing, chemical etching, and chromate conversion coating processes. The site was placed on the National Priorities List September 21, 1984 (Federal Register number 185, volume 49 and page numbers 37070-37090) because of the potential for soil, groundwater, and surface water contamination due to past waste water treatment and disposal practices employed at the site.

Four areas on the NEC facility were identified as potential sources of contamination. These areas include a sludge lagoon, a seepage pit, a sludge dump site, and a lagoon drainage ditch. From 1968 to 1976 rinse waters from the plant, after treatment with sodium hydroxide was discharged to the lagoon where metal hydroxide solids were allowed to settle before discharge of the effluent via the drainage ditch to a storm run off ditch where it combined with the City of Sparta's wastewater effluent prior to discharge into the LaCrosse River. Accumulated sludge in the lagoon was on two occasions excavated and disposed of on-site at what is referred to as the sludge dump. The seepage pit was used to neutralize spent acid waste by reaction with limestone.

A waste water treatment system was installed in 1976 which uses above ground steel settling tanks. Waste previously treated in the settling lagoon and in the seepage pit were combined and routed to the treatment system. The lagoon was used for emergency storage of untreated waste water until 1980 when a lined emergency holding lagoon was put into service. In 1981 the seepage pit was filled, graded, and revegetated.

Field investigation tasks described in the March 1985, Remedial Investigation/Feasibility (RI/FS) Work Plan(W/P) identified areas within the NEC facility where hazardous constituents posed a potential threat to public health, welfare, and the environment. This W/P was developed under an Administrative Consent Order signed September 10, 1985 in which NEC agreed to perform the RI/FS and to implement the recommended remedy for the site.

Analysis of on-site groundwater showed elevated levels of copper, fluoride, nickel, zinc, 1,1-dichloroethylene, trichloroethylene, and vinyl chloride. Data indicated that the contaminants moved with the groundwater toward the LaCrosse River where the groundwater discharges to the river at the southern boundary of the site. Highest levels of these indicator parameters were detected down gradient from and adjacent to the sludge lagoon and the seepage pit. Organic chemicals were typically below 100 parts per billion (ppb) except for trichloroethylene which was detected at levels as high as 670 ppb.

Surface soils were not contaminated except in the immediate vicinity of the drainage ditch. Soil samples collected below the sludge lagoon, sludge dump site, and seepage pit showed elevated levels of one or more of the above mentioned inorganic indicator parameters. In addition, both the sludge lagoon and the sludge dump site contained quantities of metal hydroxide sludge. The May 1986, Remedial Investigation (RI) Report may be consulted for a complete summary of the results of the site study.

The August 1987, Feasibility Study (FS), released for public comment August 27, 1987, developed and evaluated an array of remedial alternatives for each discrete waste unit on site. The FS identified remedial alternatives which provide minimization of long-term contact with contaminated soil and sludge, and prevent ingestion of contaminated groundwater.

Sludge Lagoon

Alternatives analyzed for remediation of the sludge lagoon include:

1. No action,
2. Cap the sludge lagoon and monitor the groundwater,
3. Stabilize the sludge, cap the lagoon, and monitor the groundwater,
4. Excavate sludge for off-site disposal at a RCRA approved facility and pump and treat the groundwater,
5. Excavate the sludge and the soil beneath the sludge for off-site disposal at a RCRA landfill and pump and treat the groundwater, and
6. Excavate sludge for off-site disposal at a RCRA landfill and monitor the groundwater.

The remedial objectives to minimize contact with the sludge and prevent contact with and use of groundwater downgradient to the LaCrosse River are achieved by stabilizing the sludge, capping the lagoon and monitoring the groundwater. Institutional control is achievable because there are no downgradient groundwater users, no surface water impact attributable to the discharge and the site is wholly owned by NEC.

Drainage Ditch

Alternatives analyzed for the Drainage Ditch are:

1. No action,
2. Restrict access by fencing,
3. Excavate soil and place it in the sludge lagoon, fill, and regrade the drainage ditch area, and
4. Excavate soil for off-site disposal at a RCRA landfill.

The remedial objective to eliminate the potential for contact with contaminated soil is achieved

by placement of the excavated drainage ditch soil in the sludge lagoon, which was subsequently closed in accord with the alternative for that location. The excavated area was to be filled, graded, and vegetated.

Seepage Pit

Alternatives analyzed for the seepage pit include:

1. No action,
2. Excavation of soil for off-site disposal,
3. Access restrictions and groundwater monitoring, and
4. Excavation of soil for off-site disposal and pump and treat groundwater.

The remedial objective to eliminate the potential for exposure to buried contaminated soil is met by access restriction by ownership by NEC since the area is already capped preventing casual exposure. A restriction in the property deed prevents future development in the seepage pit area.

Sludge Dump Site

Alternatives analyzed for the sludge dump site include:

1. No action (restrict access and future land development),
2. Cap sludge dump site,
3. Excavate sludge for off-site disposal in a RCRA landfill,
4. Excavate sludge and soil for off-site disposal in a RCRA landfill, and
5. Excavate sludge and soil for stabilization in the sludge lagoon.

The remedial objective to eliminate contact with buried sludge and contaminated soil is achieved by excavation of the contaminated materials and stabilization in the sludge lagoon. The dump site would be backfilled with native soil following excavation to its former grade.

On September 28, 1987, the Regional Administrator approved a Record of Decision (ROD) which selected the following remedial action at each of the designated areas on the NEC facility:

Source Control

1. Sludge Lagoon: contaminated sludges and soils in the sludge lagoon to be solidified, and a RCRA cover installed atop the lagoon to minimize leaching of contaminants into groundwater and reduce health risks related to direct contact with the sludges and soils.
2. Drainage Ditch: contaminated soil in the drainage ditch to be excavated and solidified in the sludge lagoon to minimize health risks associated with direct contact with the soil.
3. Seepage Pit: Land development restrictions will be implemented at the seepage pit to minimize the potential of direct contact with contaminated soils. Long term groundwater monitoring will be instituted to track changes in groundwater quality relative to RCRA groundwater protection standards.
4. Sludge Dump Site: Contaminated sludges and soils in the sludge dump site will be excavated and solidified in the sludge lagoon effectively minimizing the migration of contaminants into the groundwater and any risks associated with direct contact with the sludges and soil.

The ROD performance standard for the excavation of sludges and soil at the sludge dump site and excavation of soil at the drainage ditch was background or method detection limits for the indicator compounds for the remedial action to meet the RCRA clean closure requirements.

Management of Migration

Site groundwater monitoring and surface water protection are managed through use of alternate concentration limits (ACLs) as groundwater performance standards. The use of ACLs at the NEC site meet the intent of RCRA groundwater requirements and the criteria established in SARA. There are known and projected points of entry of contaminated groundwater into surfacewater. The ACLs were determined to be:

Fluoride:	4,800	F g/l
Copper:	1,000	F g/l
Nickel:	644	F g/l
Zinc:	5,000	F g/l
Trichloroethylene:	40	F g/l
Vinyl Chloride:	10	F g/l
1,1-Dichloroethylene:	10	F g/l

The concentrations for the indicator contaminants remained below the ACLs during the second five year monitoring period indicating that the remedy implemented at the NEC site remains protective of human health and the environment.

III. Remedial Action

Excavation of the combined soil and sludge at the dump site started June 6, 1988. Visual observation for the presence of sludge and impacted soil was used to define the initial limits of the excavation. The Remedial Design called for the excavation of approximately 900 cubic yards of material. Cleanup levels were not reached in all areas of the excavated sludge dump site following the initial excavation. Performance sampling showed that cleanup standards were exceeded along the east and north side walls and on the bottom of the excavation. Excavation of an additional 400 to 500 public yards of soil from these areas were required. The practical lateral limit of the additional excavation was defined by the foundations of currently existing structures which were threatened by the excavation. Copper and nickel levels in this area adjacent to the on-site structures still exceeded the proposed cleanup levels. All soil removed from the sludge dump site was moved to the sludge lagoon for stabilization. The excavated area was backfilled with native soil to the original grade and vegetative cover was provided.

The remedial action at the drainage ditch required excavating the area of the ditch to a depth of two to three feet and stabilization of the excavated material in the sludge lagoon. During the initial excavation approximately 50 feet of ditch was excavated between the sludge lagoon and the storm of ditch was excavated between the sludge lagoon and the storm runoff ditch. Two to three feet of soil was removed as determined by the depth to the groundwater. The width established during the excavation ranged from 10 feet adjacent to the sludge lagoon to about four feet at the confluence with the storm runoff ditch. About 25 cubic yards of soil were removed.

Post-excavation sampling results showed that the indicator parameters in the drainage ditch side wall samples exceed the proposed cleanup levels. Excavation of an additional 25 cubic yards extended the area to a width ranging from 18 to 20 feet for the entire length of the drainage ditch. Although significant reductions in the level of contamination were observed concentrations still exceeded the target levels. In response, an additional 18 cubic yards of soil were excavated from the area which showed the highest concentrations. A total of 68 cubic yards of soil were excavated from the drainage ditch area.

Cumulative hazard indexes have been calculated to define the risk due to exposure through ingestion of soil contaminated at these residual concentration levels. Cumulative indexes determined using appropriate data are below the maximum criteria and are considered protective of human health.

Future land development restrictions have been implemented for the seepage pit area. An affidavit has been filed with the Monroe County Register of Deeds office indicating the location of the seepage pit area and calling to attention that waste disposal activities have taken place at this location. Further notice has been provided through a deed restriction, which will prevent construction activities or placement of water wells in the areas affected by the seepage pit.

Lagoon stabilization was achieved by the addition of lime to the sludge. Lime was added to the

sludge and soil in the lagoon and mixed in place. Approximately 3150 cubic yards of combined sludge and soil were stabilized using 511 tons of lime. The lagoon stabilization was completed July 12, 1988.

Toxicity test results on samples of stabilized lagoon material show that the stabilized sludge meets the remedial objective of minimizing the leachability of the contaminants of concern. All extract results met the toxicity criteria performance standard established in the remedial design.

Unconfined compressive strength of the stabilized material was determined to be less than the design objective of 25 psi. It was reasoned that the low unconfined compressive strength of the material may be due to sheer failure along planes of sandy or organic peat lenses for which this test is not appropriate. In order to ensure adequate support for construction of the clay cap an engineered subgrade was installed which consisted of a geotextile and 12 inches of aggregate. The cap was then installed as designed to meet the requirements in 40 CFR §264.210.

The first round of baseline groundwater quality samples was collected on July 12, 1988. Samples were analyzed for trichloroethylene, vinyl chloride, 1,1-dichloroethylene, copper, nickel, zinc, and fluoride. In all rounds of sampling the concentrations for the indicator contaminants remain below the clean-up levels.

The capped sludge lagoon and drainage ditch, and the seepage pit and sludge dump site areas, groundwater monitoring wells, and fence have been maintained and inspected semi-annually since the completion of the remedial actions at the site.

The inspection of the capped sludge lagoon and drainage ditch was combined with the quarterly groundwater sampling after the completion of construction. There has been no erosion or settlement of the cap system. The only maintenance required is regular mowing. The areas of concern have maintained a very healthy grass cover during the post remedial period.

The groundwater monitoring wells are inspected at each sampling event. The other monitoring wells are inspected annually during the summer. The only required maintenance is repainting the guard casings and lubricating the locks.

Inspection of fencing is conducted annually in the summer when monitoring wells are inspected. No maintenance has been required during the post-construction period.

IV. Five-Year Review Findings

ARARS

It was determined that no new applicable or relevant and appropriate (ARARs) will necessitate a change in the remedy or remedial action. The ARARs have been reviewed and they still remain protective of human health and the environment and comply with Federal and State requirements

that are legally applicable or relevant and appropriate to the Remedial Action.

Site Visit

A Site inspection was conducted on Thursday, August 24, 2000. The scope of the inspection involved the following:

- Lagoon cover integrity,
- Seepage pit cover integrity,
- Condition of the drain system clean-outs,
- Condition of the drain system outlet,
- Condition of the site monitoring wells,
- Condition of the fence.

Results of the inspection:

- While the lagoon cover contained some evidence of rodent activity, there was no sign of erosion, settlement, bulges, cracks or dead vegetation.
- Mowing activities appear to be adequate for the Site.
- The cap to the northwest drain system clean-out was not readily accessible because of a broken wing nut.
- The cap to the western most drain system clean-out was not sealed and was unable to be sealed.
- The Site appeared to be in very good condition. The vegetative cover was plush and uniform. Monitoring wells were also in good condition.

V. Assessment

The remedy remains protection of human health and the environment. The remedial actions remain effective as no external conditions have changed since the remedy was selected. Since the remedy has been in place there are no new contaminants detected, source or pathways observed during the review of documents. The remedy has been performing in accordance with the September 28, 1987 ROD. The system operation and maintenance continue to be adequate and properly implemented. The operation and maintenance activities are limited to mowing and groundwater analyses.

Recommendations

In May of 1997, the Wisconsin Department of Natural Resources (WDNR) entered into a Consent Order with Northern Engraving. This Consent Order required Northern Engraving to continue groundwater monitoring using a lower detection limit. This was necessary because previous monitoring was performed using detection limits that exceeded the groundwater standards found in chapter NR 140, Wisconsin Administrative Code. Based on the results contained in the Five-Year Performance Report the WDNR has determined that no additional monitoring is required at this site. Once EPA has approved the Five-Year Review, the WDNR

will proceed with closing out the Consent Order. The WDNR recommends that Northern Engraving Corporation submit an annual letter report to USEPA, which includes the results of the annual inspection. USEPA will then have all the necessary information in order to compile future five-year reports.

Recommended Follow-up:

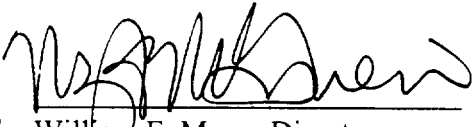
- The caps to the drain system clean-outs shall be repaired so that they are again readily accessible and water tight
- The mole holes shall be stamped back down and seeded as necessary.
- Monitoring wells that are not part of the current monitoring program shall be properly abandoned. Documentation on WDNR well abandonment forms shall be completed following abandonment and submitted to WDNR. This includes wells: A, B, C, D, G, and H. Monitoring well SW-2 shall remain and shall be incorporated into the monitoring program for the Northern Engraving Solvent Storage Site.
- Monitoring wells, SW-1A, SW-1B, SW-1C, F-1 and F-2 shall remain in place until the WDNR closes out the Consent Order.

V. Statement on Protectiveness

The remedies selected for this site remain protective of human health and the environment. All the completion requirements for this site have been met as specified in OSWER Directive 9320.2-3A. Specifically, confirmatory sampling has verified that the ROD cleanup objectives have been achieved and all cleanup actions specified in the ROD have been implemented.

VI. Next Five-Year Review

The next Five-Year review will occur by September 2005.


for William E. Muno, Director
Superfund Division

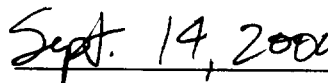

Date

FIGURE 1

